

Montana Fish, Wildlife & Parks

SPECIFICATIONS FOR WORK SPECIAL PROVISIONS

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1. PROJECT DESCRIPTION

The Project involves construction work associated with:

**Martinsdale Fishing Access Site (FAS) Road Improvement
Fish, Wildlife & Parks (FWP) Project # 7133717
Located in Meager/Wheatland County, MT**

The project includes road grading and shaping, gravel base course and crushed top surfacing gravel.

Project Objective: Reshaping, resurfacing and improving drainage of existing roads.

Scope of Work: Work includes the following but is not limited to the general description contained herein:

BASE BID ITEMS:

1. Mobilization
2. Excavation – Includes all unclassified excavation, rough grading, removal of spoils to deposit area, leveling of spoils.
3. Base Course – Includes all materials and labor to install 3" minus base course for roads and parking areas.
4. Crushed Surfacing 1" (-) – Includes all materials and labor to install 1" minus crushed surfacing for roads and parking areas.
5. Compaction Testing Allowance – Estimated cost to conduct compaction testing as required by FWP engineer.

2. PROJECT RELATED CONTACTS

Project contacts are designated as follows:

Owner:

Montana FWP
1420 E. Sixth Ave.
PO Box 200701
Helena, MT 59620-0701

FWP Project Representative:

Kevin McDonnell
FWP Project Manager
1522 9th Avenue
Helena, MT 59620
406-841-4010 (wk)
406-431-1288 (cell)
406-841-4004 (fax)

3. SITE INSPECTION

All Bidders should satisfy themselves as to the construction conditions by personal examination of the site described in this document. Bidders are encouraged to make any - investigations necessary to assess the nature of the construction and the difficulties to be encountered, see General Conditions, Article 3.

4. SOILS INFORMATION

Geotechnical investigation work has been completed for this Project. It is the responsibility of the Bidders to review and interpret all investigations, findings, and reports made part of this contract prior to bid preparation, see General Conditions, Article 3.

5. PROJECT REPRESENTATIVE, INSPECTIONS, AND TESTING

The Contractor's work will be periodically tested and inspected to insure compliance with the Contract Documents. Complete payment will not be made until the Contractor has demonstrated that the work is complete and has been performed as required. If the Project Representative detects a discrepancy between the work and the requirements of the Contract Documents at any time, up to and including final inspection, such work will not be completely paid for until the Contractor has corrected the deficiency, see General Conditions, Article 9.

The Project Representative will periodically monitor the construction of work to determine if the work is being performed in accordance with the contract requirements. The Project Representative does not have the authority or means to control the Contractor's methods of construction. It is, therefore, the Contractor's responsibility to utilize all methods, equipment, personnel, and other means necessary to assure that the work is installed in compliance with the Drawings and Specifications, and laws and regulations applicable to the work. Any discrepancies noted shall be brought to the Contractor's attention, who shall immediately correct the discrepancy. Failure of the Project Representative to detect a

discrepancy will not relieve the Contractor of his ultimate responsibility to perform the work as required, see General Conditions, Article 3.

The Contractor shall inspect the work as it is being performed. Any deviation from the Contract requirements shall be immediately corrected. Prior to any scheduled inspection by the Project Representative, the Contractor shall again inspect the work and certify to the Project Representative that he has inspected the work and it meets the requirements of the Contract Documents. The Project Representative may require uncovering of work to verify the work was installed according to the contract documents, see General Conditions, Article 12.

The work will be subject to review by the Project Representative. The results of all such inspections, and all contract administration, shall be directed to the Contractor only through the Project Representative.

5.1 Services Required by the Contractor. The Contractor shall provide the following services:

- a. Any field surveys to establish locations, elevations, and alignments as stipulated on the Contract Documents. FWP reserves the right to set preliminary construction staking for the project. The Contractor is responsible to notify FWP for any construction staking discrepancies.
- b. Preparation and certification of all required shop drawings and submittals as described in the General Conditions, Article 3.gf
- c. All testing requiring the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to the Project Representative. The laboratory shall be staffed with experienced technicians properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- d. Preparation and submittal of a construction schedule, including submittals, see General Conditions, Article 3. The schedule shall be updated as required, as defined in the Contract Documents.
- e. All Quality Control testing as required by the Contractor's internal policies.
- f. All Quality Assurance testing and/or re-testing as stated in the Contract Documents, see General Conditions, Article 13.

5.2 Services Provided by the Owner. The Owner shall provide the following services at no cost to the Contractor except as required for retests as defined in the Contract Documents.

- a. The Project Representative may check compaction of backfill and surfacing courses using laboratory testing submittal information supplied by the Contractor. These

tests are to determine if compaction requirements are being fulfilled in accordance with the Contract Documents. It is ultimately the responsibility of the Contractor to insure that this level of compaction is constant and met in all locations.

- b. Any additional Quality Assurance testing deemed appropriate by the Owner, at the Owner's expense.

6. ENGINEERING INTERPRETATIONS

Timely Engineering decisions on construction activities or results have an important bearing on the Contractor's schedule. When engineering interpretation affects a plan design or specifications change, it should be realized that more than 24 hours may be required to gain the necessary Owner participation in the decision process including time for formal work directive, or change order preparation as required.

7. REJECTED WORK

Any defective work or nonconforming materials or equipment that may be discovered at any time prior to the expiration of the warranty period, shall be removed and replaced with work or materials conforming to the provisions of the Contract Documents, see General Conditions, Article 12. Failure on the part of the Project Representative to condemn or reject bad or inferior work, or to note nonconforming materials or equipment on the Contractors submittals, shall not be construed to imply acceptance of such work. The Owner shall reserve and retain all its rights and remedies at law against the Contractor and its Surety for correction of any and all latent defects discovered after the guarantee period (MCA 27-2-208).

Only the Project Representative will have the authority to reject work which does not conform to the Contract Documents.

8. UTILITIES

The exact locations of existing utilities that may conflict with the work are not precisely known. It shall be the Contractor's responsibility to contact the owners of the respective utilities and arrange for field location services. **One Call Locators, 1-800-424-5555**

The Contract Documents may show utility locations based on limited field observation and information provided to the Project Representative by others. **The Project Representative cannot guarantee their accuracy.** The Contractor shall immediately notify the Project Representative of any discrepancies with utility locations as shown on the Contract Drawings and/or their bury depths that may in any way affect the intent of construction as scoped in these specifications.

There will be no separate payment for exploratory excavation required to locate

underground utilities.

9. CONSTRUCTION SAFETY

The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees and subcontractors) and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve them from compliance with the obligations and penalties set forth therein, see General Conditions, Article 10.

10. CONSTRUCTION LIMITS AND AREAS OF DISTURBANCE

10.1 Construction Limits. Where construction easements or property lines, are not specifically called out on the Contract Documents, limit the construction disturbance to ten (10) feet, when measured from the edge of the slope stake grading, or to the adjacent property line, whichever is less. Disturbance and equipment access beyond this limit is not allowed without the written approval of both the Project Representative and the Owner of the affected property. If so approved, disturbance beyond construction limits shall meet all requirements imposed by the landowner; this includes existing roads used and/or improved as well as the construction of new access roads. Special construction, reclamation, or post-construction reclamation or other closure provisions required by the landowner on access roads beyond the construction limits shall be performed by the Contractor at no additional cost to the Owner.

10.2 Areas of Disturbances. Approved areas of disturbance are those areas disturbed by construction activities within the construction limits and along designated or approved access routes. Such areas may require reclamation and revegetation operations, including grading to the original contours, top soiling with salvaged or imported topsoil, seeding, fertilizing, and mulching as specified herein. Other areas that are disturbed by the Contractor's activities outside of the limits noted above will be considered as site damage or unapproved areas of disturbance, see General Conditions, Articles 3 and 10. This includes areas selected by the Contractor outside the defined construction limits for mobilization, offices, equipment, or material storage.

11. DECONTAMINATE CONSTRUCTION EQUIPMENT

Power wash all construction equipment entering the project site to prevent the spread of noxious weeds and aquatic invasive species. This applies to all FWP projects, whether or not individual construction permits specifically address cleaning of equipment.

12. TREE PROTECTION AND PRESERVATION

The Contractor and the Owner shall individually inspect all trees within the project construction limits prior to construction. The Owner shall determine which trees are to be removed and which trees are to be preserved. Construction of the grading, utilities and various roadway facilities must not significantly damage the trees root system or hinder it's chances for survival. Reasonable variations from the Contract Documents, as directed by the Project Representative, may be employed to ensure the survival of trees.

13. CONSTRUCTION SURVEYS

The Contractor will be responsible for all layout and construction staking utilizing the Project Representative's existing control and coordinate data for the project. Dimensions and elevations indicated in layout of work shall be verified by the Contractor. Discrepancies between Drawings, Specifications, and existing conditions shall be referred to the Project Representative for adjustment before work is performed. The Project Representative may set location and grade stakes prior to construction; however, it is ultimately the responsibility of the Contractor to check and verify all construction staking for the project.

Existing survey control (horizontal and vertical) has been set for use in the design and ultimately the construction of these improvements. A listing of the coordinates and vertical elevation for each of these control points may be included in the project drawings.

The Contractor will be responsible for preserving and protecting the survey control until proper referencing by the Contractor has been completed. Any survey control obliterated, removed, or otherwise lost during construction will be replaced at the Contractor's expense.

Contractor shall be aware of property pins and survey monuments. Damage to these pins will require replacement of such by a registered land surveyor at no cost to the owner.

The Contractor shall provide construction staking from the Contractor's layouts and the control points. Contractor's construction staking includes at a minimum:

1. Slope stakes located at critical points as determined by the Project

Representative.

2. Blue tops every longitudinally and transversely for subgrade and crushed base to verify finish grading of course.
3. Location and grade stakes for drainage features and retaining walls.
4. Location stakes for roadside safety items, permanent and temporary traffic control, and misc. items as determined by the Project Representative.

Original field notes, computations and other records taken by the Contractor for the purpose of quantity and progress surveys shall be furnished promptly to the Project Representative and shall be used to the extent necessary in determining the proper amount of payment due to the Contractor.

14. MATERIAL SOURCES AND CONSTRUCTION WATER

The Contractor shall be responsible for locating all necessary material sources, including aggregates, earthen borrow and water necessary to complete the work. The Contractor shall be responsible for meeting all transportation and environmental regulations as well as paying any royalties.

The Contractor may use materials from any source, providing the materials have been tested through representative samples and will meet the Specifications.

Water for compaction efforts shall be supplied by the Contractor.

15. MATERIALS SALVAGE AND DISPOSAL

Notify the Owner for any material salvaged from the project site not identified in the Contract Documents. The Owner reserves the right to maintain salvaged material at the project site, compensate the Contractor for relocation of salvaged material, or agreed compensation to Owner for material salvaged by the Contractor.

Haul and waste all waste material to a legal site and obey all state, county, and local disposal restrictions and regulations.

16. STORED MATERIALS

Contractor shall use an approved storage area for materials. Materials and/or equipment purchased by the Contractor may be compensated on a monthly basis. For compensation, provide the Project Representative invoices for said materials, shop drawings and/or submittals for approval, and applicable insurance coverage, see General Conditions, Article 9.

17. STAGING AND STOCKPILING AREA

Contractor shall use staging and stockpiling sites for to facilitate the project as approved by the Owner. Contract Documents may show approved staging and stockpiling locations. Notify Owner within 24 hours for approval of staging and stockpiling sites not shown on the Contract Drawings.

18. SECURITY

The Contractor shall provide all security measures necessary to assure the protection of equipment, materials in storage, completed work, and the project in general.

19. CLEANUP

Cleanup for each item of work shall be fully completed and accepted before the item is considered final. If the Contractor fails to perform cleanup within a timely manner the Owner reserves the right to withhold final payment.

Review these Contract Documents for additional Final Cleanup specifications for specific measures, associated with Contractor responsibilities and final payment.

20. ACCESS DURING CONSTRUCTION

Provide emergency access at all times within the project throughout the construction period.

21. CONSTRUCTION TRAFFIC CONTROL

The Contractor is responsible for providing safe construction and work zones within the project limits by implementing the rules, regulations, and practices of the Manual on Uniform Traffic Control Devices, current edition.

22. SANITARY FACILITIES

There is an existing concrete vault latrine on site.

23. CONTRACT CLOSEOUT

The Contractor's Superintendent shall maintain at the project site, a "Record Set of Drawings" showing field changes, as-built elevations, unusual conditions encountered during construction, and such other data as required to provide the Owner with an accurate "as constructed" set of record drawings. The Contractor shall furnish the "Record Set" to the Project Representative following the Final Inspection of the Project.

The Contractor's final payment will not be processed until the "Record Set" of drawings are received and approved by the Project Representative.

24. MEASUREMENT AND PAYMENT

Review these Contract Documents for additional Measurement and Payment specifications for definitions. Quantities are listed on the Bid Proposal for Payment Items. Additional material quantities, volumes, and measurements may be shown on the Contract Document drawings and/or specifications.

Unit Price quantities and measurements shown on the Bid Proposal are for bidding and contract purpose only. Quantities and measurements supplied, completed for the project, and verified by the Project Representative shall determine payment. Each unit price will be deemed to include an amount considered by the Contractor to be adequate to cover Contractor's overhead and profit for each bid item.

Lump sum bid item quantities will not be measured. Payment for these lump sum bid proposal items will be paid in full amount listed on the Bid Proposal when accepted by the Project Representative, unless specified otherwise.

TECHNICAL SPECIFICATIONS

INDEX TO
TECHNICAL SPECIFICATIONS
MARTINSDALE FAS ROAD IMPROVEMENT

FWP# 7133717

DIVISION 2 SITE WORK

Section 01400 - Quality Control
Section 01410 - Testing Laboratory Services
Section 02207 - Aggregate Material
Section 02211 - Rough Grading
Section 02231 - Aggregate Courses

PLAN SHEETS

Sheet 1 – Cover
Sheet 2 – Site Plan
Sheet 3 – Typical Sections and Project Notes

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References
- C. Inspection and testing laboratory services.

1.2 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.3 REFERENCES

- A. Conform to reference standard by date of issue current on January 1, 2005.
- B. Should specified reference standards conflict with Contract Documents, or Regulations request clarification for Architect/Engineer before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.4 INSPECTION AND TESTING LABORATORY SERVICES

- A. Contractor will appoint, employ, and pay for services of an independent firm to perform inspection and testing.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Architect/Engineer.
- C. Reports will be submitted by the independent firm to the Architect/Engineer, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- D. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect/Engineer. Payment for retesting will be charged to the Contractor.
- E. The Contractor shall deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
- F. The Contractor shall cooperate with laboratory personnel, and provide access to the work.
- G. The Contractor shall provide incidental labor tools and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- H. The Contractor shall notify Architect/Engineer and laboratory 48 hours prior to expected time for operations requiring inspection and testing services.
- I. The Contractor may arrange with laboratory and pay for additional samples and tests desired by Contractor beyond specified requirements.

OWNER

- A. Engineer will perform periodic field inspections to determine testing is required.

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A Selection and payment.
- B Contractor submittals.
- C Laboratory responsibilities.
- D Laboratory reports.
- E Limits on testing laboratory authority.
- E Contractor responsibilities.
- F Schedule of inspections and tests.

1.2 REFERENCES

- A. ANSI/ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.3 SELECTION AND PAYMENT

- A. Contractor shall employ the services of an independent testing laboratory to perform specified inspection and testing. The testing agency will be approved by the FWP Engineer prior to testing.
- B. Employment of testing laboratory shall in no way relive Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.4 QUALITY ASSURANCE

- A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740.
- B. Laboratory: Authorized to operate in state in which Project is located.
- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.5 CONTRACTOR SUBMITTALS

- A. Prior to testing, submit testing laboratory name, address, and telephone number, and names of full time registered Engineer and responsible officer.
- B. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards (NBS) during most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

1.6 LABORATORY RESPONSIBILITIES

- A. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.
- B. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- C. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

1.7 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Architect/Engineer, and to Contractor.
- B. Include:
 - 1. Date issued,
 - 2. Project title and number,
 - 3. Name of inspector,
 - 4. Date and time of sampling or inspection,
 - 5. Identification of product and Specifications Section,
 - 6. Location in the Project,
 - 7. Type of inspection or test,
 - 8. Date of test,
 - 9. Results of tests,
 - 10. Conformance with Contract Documents.
- C. Provide interpretation of test results to Engineer.

1.8 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

1.9 CONTRACTOR RESPONSIBILITIES

- A. Contract with an appropriate testing agency and make arrangements with the testing agency to perform the tests required in the contract documents.

END OF SECTION

SECTION 02207

AGGREGATE MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. References
- B. Submittals
- C. Aggregate materials and engineering fabric
- D. Source quality control
- E. Stockpiling
- F. Stockpile clean up

1.2 RELATED SECTIONS

- A. Section 02211 - Rough Grading.
- B. Section 02231 - Aggregate Courses.

1.3 REFERENCES

- A. AASHTO - M147 - Materials for Aggregate and Soil-Aggregate.
- B. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- C. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
- D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 SUBMITTALS

- A. Submit laboratory test results for each type of aggregate material 15 days prior to installation, for Project Manager approval.
 - 1. Each aggregate material used as a base or surfacing material shall have as a

minimum the following laboratory tests completed:

- I. Sieve Analysis
- II. Proctor
- III. Atterberg Limit Test (crushed top surfacing only)

- B. Materials Source: Submit name of imported materials suppliers. Provide materials from same source throughout the work. Change of source requires retesting at the Contractor's expense.
- C. Change of source requires Engineer's approval.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS AND ENGINEERING FABRIC

- A. Pit run base course, 3" (-) free of shale, clay, friable material and debris; graded in accordance with AASHTO T-11 and T-27, within the following limits:

TABLE OF GRADUATIONS
Percentage of Weights Passing Square
Mesh Sieves

	Grade 1
3 Inch Sieve	100%
No. 4 Sieve	25-60%
No. 200 Sieve	2-10%

- 1. Material shall be evenly graded.
- 2. 5% oversized material is permitted.

- B. Crushed Top Surfacing; free of silt, lumps of clay, loam, friable or soluble materials, and organic matter; graded in accordance with ANSI/ASTM C136; within the following limits:

TABLE OF GRADUATIONS
Percentage by Weights Passing Square
Mesh Sieves

Passing	% Passing
1"	100 %
3/4"	
1/2"	
3/8"	
#4	40% - 70%
#10	25% - 55%
#16	
#30	
#50	
#100	
#200	5% - 12%

The aggregate for all grades, including added binder or filler, shall meet the following supplemental requirements.

- (1) Dust Ration. The portion passing the No. 200 Sieve shall not be greater than 2/3 of the portion passing the No. 40 Sieve.
- (2) The liquid limit for that portion of the fine aggregate passing a No. 40 Sieve shall not exceed 25 and the plasticity index (PI) shall be less than six, as determined by AASHTO T-89 and T-90.
- (3) No intermediate sizes for cover aggregate, or for other purposes, shall be removed from the material in the course of production unless authorized in writing by the Architect/Engineer.
- (4) The material shall meet all the requirements of this section when it arrives on the project site. Windrow mixing of different materials to obtain the specified material will not be allowed. If bentonite is to be added, it shall be done in a method approved by the Engineer.
- (5) At least 50% by weight of the aggregate retained on the No. 4 sieve must have at least one mechanically fractured face.

2.2 SOURCE QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01019.
- B. Tests and analysis of aggregate material will be performed in accordance with AASHTO T-11 and T-27 and as specified in this Section.

- C. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 STOCKPILING

- A. Stockpile materials on site at locations approved by Engineer.
- B. Separate differing materials with dividers or stockpile apart to prevent mixing.
- C. Stockpile in sufficient quantities to meet project schedule and requirements.
- D. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in a clean, neat condition reseed as necessary. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 02211

ROUGH GRADING

PART 1 GENERAL

1.1 SECTION INCLUDE

- A. Removal of topsoil and subsoil.
- B. Excavating, grading, filling and rough contouring the site for parking area and boat ramp construction.
- C. Measurement and Payment

1.2 RELATED SECTIONS

- A. Section 01410 - Testing Laboratory Services: Testing fill compaction.
- B. Section 02110 - Site Clearing
- C. Section 02207 - Aggregate Materials.

1.3 REFERENCES

- A. AASHTO T180 - Moisture-Density Relations of Soils using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

PART 2 EXECUTION

2.1 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Notify utility companies to locate buried utilities.
- D. Locate, identify, and protect utilities that remain from damage.

2.3 FILLING

- A. Fill areas to contours and elevations with unfrozen materials.
- B. Place fill materials on continuous layers and compact. See Section 02231

- C. Maintain optimum moisture content of fill materials to attain required compaction density.
- D. Make grade changes gradual. Blend slope into level areas.

2.4 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed as necessary by the Engineer.
- B. Compaction testing will be performed in accordance with ASTM D2922. If determined necessary by the FWP Engineer.
- C. Placement of base aggregate and subsequent road surfacing shall not commence until Engineer has been notified and has had 48 hours to inspect rough grading.

2.4 MEASUREMENT AND PAYMENT

- A. The Rough Grading described in Section 02211 shall be included under Excavation Bid Item #2 on the Bid Form.

END OF SECTION

SECTION 02231

AGGREGATE COURSES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aggregate courses.

1.2 RELATED SECTIONS

- A. Section 01025 - Measurement and Payment: Requirements applicable to lump sum.

1.3 REFERENCES

- A. AASHTO T180 - Moisture-Density Relations of Soils using a 10lb (4.54 kg) Rammer and an 18 in. (457mm) Drop.
- B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

PART 2 PRODUCTS

2.1 SURFACING MATERIALS

- A. 1 inch minus Crushed Top Surfacing (CTS): As specified in Section 02207.
- B. 3 inch minus crushed base course: As specified in Section 02207.

PART 3 EXECUTION

3.1 AGGREGATE PLACEMENT

- A. Spread material over prepared substrate to a total compacted thickness indicated for each material. A vibratory roller is suggested for compaction.
- B. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content. Compact aggregate materials and sub-grade to minimum 90 percent of maximum density.
- C. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.2 TOLERANCES

- A. Flatness: Maximum variation of 1/10 foot in 10 feet measured along existing slope.
- B. Scheduled Compacted Thickness: Within 1/4 inch of designated thickness.

Compaction Testing	Location	Frequency
Base Course	Access Road (centerline)	1 per 50 lineal feet*
Crushed Top Surfacing	Access Roads	1 *

*Location determined by FWP Engineer

3.3 FIELD QUALITY CONTROL

- A. Contractor will be responsible for field quality control. FWP Engineer will inspect all work and notify the contractor if compaction testing will be required.
- B. Compaction testing will be performed in accordance with ASTM D2922.
- C. If tests indicate Work does not meet specified requirements, recompact and retest or at Engineer's discretion, remove Work, replace and retest.

3.4 MEASUREMENT AND PAYMENT

- A. All material and labor described in this section shall be bid and compensated under the associated material as listed on the bid form, or under the Compaction Testing Allowance Bid Item #5

END OF SECTION